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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/613,068	07/10/2000	Se-Hyoung Kim	678-514-(APA9464	8817
28249	7590	12/02/2004	EXAMINER	
DILWORTH & BARRESE, LLP 333 EARLE OVINGTON BLVD. UNIONDALE, NY 11553			KADING, JOSHUA A	
			ART UNIT	PAPER NUMBER
			2661	

DATE MAILED: 12/02/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	Application No. 09/613,068	Applicant(s) KIM ET AL.	
	Examiner Joshua Kading	Art Unit 2661	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 27 September 2004.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 1-5, 7-18, 20-22, 25-34, 37, 38, 41-43, 45-47, 49-53, 55-58 and 61-70 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-5, 7, 8, 11-17, 20-22, 25-30, 32-34, 37, 38, 41, 45-47, 49-53, 56-58 and 61-70 is/are rejected.
- 7) ☐ Claim(s) 9, 10, 18, 31, 42, 43, and 55 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

**DETAILED ACTION**

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

5 (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.  
10

Claims 1-5, 7, 8, 12-17, 20-22, 26-30, 32-34, 37, 38, 41, 45-47, 50-53, 56-58, 61, 62, 64-66, 68, and 69 are rejected under 35 U.S.C. 103(a) as being unpatentable over Markarian et al. (U.S. Patent 6,553,539 B1) in view of applicant's admitted prior art  
15 (AAPA).

Regarding claims 1, 61, 65, and 68, Markarian discloses "an encoder for receiving a first information bit stream and for outputting three streams, a second information bit stream, a first parity stream, and a second parity stream by encoding the  
20 first information bit stream (figure 1, encoder 11, information bit stream 12 and parity bit streams 13 as described in col. 2, lines 19-25); an interleaver for interleaving the encoded streams by a predetermined interleaving rule (figure 1, element 17); a demultiplexer for separating each of the at least one radio frames received from the radio frame segmenter into a third information bit stream, and first and second parity  
25 streams from the demultiplexer (figure 1, element 14); and a rate matcher for bypassing the third information bit stream and for puncturing a part of the first and second parity

streams from the demultiplexer according to a given rate matching rule (figure 18, element 18 where the puncturing module is functionally equivalent to a rate matcher)."

However, Markarian lacks what AAPA discloses, "a radio frame segmenter for receiving the interleaved stream from the interleaver and mapping the received  
5 interleaved stream onto at least one consecutive radio frame (figure 1, element 130; specification page 2, line 26-page 3, line 1)."

It would have been obvious to one with ordinary skill in the art at the time of invention to include the radio frame segmenter for the purpose of creating radio frames at a predetermined size. The motivation for creating the frames at predetermined sizes  
10 is so that they conform to the appropriate protocols and standards of other devices, such as the encoder.

Regarding claims 13, 27, 37, and 51, Markarian discloses "an encoder for receiving an information bit stream transmitted at a predetermined transmission time  
15 interval (TTI) and for outputting the information bit stream and at least one type of parity stream by encoding the information bit stream in accordance with a coding rate of said encoder (figure 1, encoder 11, information bit stream 12 and parity streams 13); an interleaver for receiving the information bit stream and the at least one type of parity stream from the encoder, for interleaving the information bit stream and the at least one  
20 type of parity stream and for outputting interleaved stream (figure 1, element 17); a demultiplexer for receiving the radio frames and for demultiplexing the received radio frames back into the information bit stream and the at least one type of parity stream

(figure 1, element 14); and a rate matcher for rate matching the streams received from the demultiplexer and outputting rate matched streams, said rate matcher having at least one component rate matcher for rate matching a part of the parity stream, a number of the at least one component rate matcher being equal to a number of the parity streams (figure 18, element 18 where the puncturing module is functionally equivalent to a rate matcher), wherein the demultiplexer switches each of the parity bits in the radio frames to said at least one component rate matcher (figure 1, elements 16 are demuxed parity bits that are sent to the corresponding rate matcher of 18)."

However, Markarian lacks what AAPA discloses, "a radio frame segmenter for receiving the interleaved stream from the interleaver, for dividing the received stream into radio frames, and for outputting the radio frames in sequence (figure 1, element 130; specification page 2, line 26-page 3, line 1)" and that there are rate matchers that "correspond to each of the parity bits (figure 1, elements 140, where there is only one rate matcher per stream and thus one of ordinary skill in the art would know that there is a corresponding number of rate matchers per bit streams)"

It would have been obvious to one with ordinary skill in the art at the time of invention to include the radio frame segmenter for the purpose of creating radio frames at a predetermined size. The motivation for creating the frames at predetermined sizes is so that they conform to the appropriate protocols and standards of other devices, such as the encoder.

Regarding claims 2, 20, 32, 45, 56, 62, 66, and 69, Markarian and AAPA disclose the systems and methods of claims 1, 13, 27, 37, 51, 61, 65, and 68. However, Markarian lacks what AAPA further discloses, "wherein the interleaved stream is mapped onto consecutive radio frames when a transmission time interval (TTI) is longer than 10 ms (page 2, lines 20-28 where any of the TTIs lead to a mapping onto radio frames)." It would have been obvious to one with ordinary skill in the art to include the TTI longer than 10ms for the same reasons and motivation as in claims 1, 13, 27, 37, 51, 61, 65, and 68.

Regarding claims 3, 21, 33, 46, and 57, Markarian and AAPA disclose the systems and methods of claims 1, 13, 27, 37, and 51. However, Markarian lacks what AAPA further discloses, "a transmission time interval (TTI) of the information bit stream is one of 10, 20, 40, and 80 ms (specification page 2, line 21)." It would have been obvious to one with ordinary skill in the art at the time of invention to include one TTI of 10, 20, 40, and 80 ms for the same reasons and motivation as in claims 1, 13, 27, 37, and 51.

Regarding claim 4, Markarian and AAPA disclose the system of claim 1. However, Markarian and AAPA lack "wherein the interleaving rule is a bit reverse method." Although neither Markarian nor AAPA disclose the interleaving rule type, it would have been obvious to one with ordinary skill in the art at the time of invention to have the interleaving rule be of a bit reverse method type as a matter of design choice.

Since there are many different kinds of interleaving methods available, it is a designer's preference which to use. The motivation for using the interleaving is to create a more robust and less error prone system, as is known in the art.

5           Regarding claim 5, Markarian and AAPA disclose the system of claim 1.  
However, Markarian lacks what AAPA further discloses, "wherein an arrangement of information bits and parity bits in each of the at least one radio frames has a regular pattern (specification page 3, lines 22-23)." It would have been obvious to one with ordinary skill in the art at the time of invention to include the radio frame having a  
10 regular pattern with the transmitting device in claim 1 for the same reasons and motivation as in claim 1.

          Regarding claims 16, 30, 38, and 53, Markarian and AAPA disclose the systems and methods of claims 13, 27, 37, and 51. However, Markarian lacks what AAPA further  
15 discloses, "wherein bits of the radio frame are separated to the at least one component rate matcher corresponding to each type of parity stream in accordance with a regular pattern for arranging information bits and parity bits in each radio frame (specification page 3, lines 22-23)." It would have been obvious to one with ordinary skill in the art at the time of invention to include separating the radio frame into streams following a  
20 regular pattern for the same reasons and motivation as in claims 13, 27, 37, and 51.

Regarding claims 7, 14, 28, 41, and 52, Markarian and AAPA disclose the systems and methods of claims 2, 16, 30, 38, and 53. However, Markarian lacks what AAPA further discloses, "the consecutive radio frames having initial bits determined by a TTI (specification page 2, lines 21 and 23-24 where it is implied from the TTI's and the frame data size that the initial symbol will be different based on different TTI's)." It would have been obvious to one with ordinary skill in the art at the time of invention to include the initial symbols determined by a TTI for the same reasons and motivation as in claims 2, 16, 30, 38, and 53.

Regarding claim 8, Markarian and AAPA disclose the system of claim 5. However, AAPA lacks what Markarian further discloses, "wherein the demultiplexer separates bits of the radio frame into the third information bit stream, and the first and second parity streams from the demultiplexer according to the regular pattern (figure 1, elements 14 and bit streams 15 and 16)." It would have been obvious to one with ordinary skill in the art at the time of invention to include the first bit stream, and second and third parity streams for the same reasons and motivation as in claim 5.

Regarding claims 12 and 64, Markarian and AAPA disclose the systems of claims 1 and 61. However, Markarian lacks what AAPA further discloses, "a first component rate matcher for rate-matching the information bits; a second component rate matcher for rate-matching the first parity bits; and a third component rate matcher for rate-matching the second parity bits (figure 1, elements 140 where if N is equal to 3



then there are first, second, and third rate matchers)." It would have been obvious to one with ordinary skill in the art at the time of invention to include the first, second, and third rate matchers for the same reasons and motivation as in claim 1 and 61.

5           Regarding claims 15 and 29, Markarian and AAPA disclose the systems of claims 14 and 28. However, Markarian lacks what AAPA further discloses, "wherein the regular pattern is further determined by the coding rate (page 2, lines 20-25 of the specification)." It would have been obvious to one with ordinary skill in the art at the time of invention to include the determining the pattern using the coding rate with the  
10   transmitting device in claim 14 and the method of claim 28 for the same reasons and motivation as in claims 14 and 28.

          Regarding claim 17, Markarian and AAPA disclose the system of claim 13. However, Markarian lacks what AAPA further disclose, "a multiplexer for multiplexing  
15   the rate matched streams outputs of at least one component rate matcher (figure 1, element 150 where 150 takes in the different streams from the different rate matcher components 140 and multiplexes them)." It would have been obvious to one with ordinary skill in the art at the time of invention to include the multiplexer with the transmitting device in claim 13 for the same reasons and motivation as in claim 13.

20

          Regarding claims 22, 34, 47, and 58, Markarian and AAPA disclose the systems and methods of claims 13, 27, 37, and 51. However, AAPA lacks what Markarian further

discloses, "wherein the coding rate is 1/3 (col. 1, lines 20-22)." It would have been obvious to one with ordinary skill in the art at the time of invention to include the 1/3 coding rate for the same reasons and motivation as in claims 13, 27, 37, and 51.

5           Regarding claims 26 and 50, Markarian and AAPA disclose the systems of claims 13 and 37. However, AAPA lacks what Markarian further discloses, "wherein the encoder is a turbo encoder (figure 1, element 11 is labeled as a turbo encoder)." It would have been obvious to one with ordinary skill in the art at the time of invention to include turbo encoder for the same reasons and motivation as in claims 13, 27, 37, and  
10   51.

Claims 11, 63, 67, and 70 are rejected under 35 U.S.C. 103(a) as being unpatentable over Markarian et al. and AAPA as applied to claims 1, 61, 65, and 68 above, and further in view of Nakakita et al. (U.S. Patent 6,061,820).

15           Regarding claims 11, 63, 67, and 70, Markarian and AAPA disclose the systems and method of claims 1, 61, 65, and 68. However, Markarian and AAPA lack what Nakakita discloses, "wherein the interleaver interleaving the encoded streams at a TTI (Transmission Time Interval) after inserting filler bits into the encoded streams in order to equalize a size of the at least one radio frames (col. 19, lines 54-62)." It would have  
20   been obvious to one with ordinary skill in the art at the time of invention to include the filler bits for the purpose of making the data a uniform length for interleaving (Nakakita, figure 14A shows the filling of data to make a uniform length; AAPA, specification, page

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2, lines 26-page 3, line 1 where the interleaver makes 10ms length radio frames and thus if there isn't enough data to create a 10 ms frame, Nakakita provides for padding with dummy data). The motivation is so that the created data will conform to the protocols and standards of the system.

5

Claims 25 and 49 are rejected under 35 U.S.C. 103(a) as being unpatentable over Markarian et al. and AAPA as applied to claims 16 and 41 above, and further in view of Williamson et al. (U.S. Patent 6,615,387 B1).

10 Regarding claims 25 and 49, Markarian and AAPA disclose the systems of claims 16 and 41. However, Markarian and AAPA lack what Williamson discloses, "a memory for storing the regular pattern including an initial symbol corresponding to each of the radio frames (col. 28, claim 18, lines 22-38 where the regular pattern is inherently stored in the way the codeword is created through the use of the memory and the initial symbol is stored by way of the LSB bits)." It would have been obvious to one with  
15 ordinary skill in the art at the time of invention to include the memory for storing the regular pattern and initial symbol for the purpose of creating a codeword for user data. The motivation for creating a codeword for data is to create a way to recover from errors in transmission.

20

***Allowable Subject Matter***

Claims 9, 10, 18, 31, 42, 43, and 55 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

5

***Response to Arguments***

Applicant's arguments, see Remarks, page 13, paragraph 1, filed 27 September 2004, with respect to the 35 U.S.C. 112 second paragraph rejection of claim 18 have been fully considered and are persuasive. The 35 U.S.C. 112 second paragraph rejection of claim 18 has been withdrawn.

10

Applicant's arguments, see Remarks, page 14, paragraph 1, filed 27 September 2004, with respect to the objections of claims 1-3, 5, 13, 16, 27, 30, 37, 51, and 53 have been fully considered and are persuasive. The objections of claims 1-3, 5, 13, 16, 27, 30, 37, 51, and 53 have been withdrawn.

15

Applicant's arguments with respect to claims 1, 13, 27, 37, and 51 have been considered but are moot in view of the new ground(s) of rejection.

20

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Joshua Kading whose telephone number is (571) 272-3070. The examiner can normally be reached on M-F: 8:30AM-5PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kenneth Vanderpuye can be reached on (571) 272-3078. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

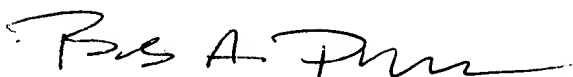
- 5 Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should
- 10 you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Joshua Kading  
Examiner  
Art Unit 2661

November 26, 2004

15



**BOB PHUNKULH**  
**PRIMARY EXAMINER**